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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,138	12/18/2001	Vasanth Philomin	US 010620	1222

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EXAMINER

STREGE, JOHN B

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/023,138

Applicant(s)

PHILOMIN ET AL.

Examiner

John B Strege

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/18/01, 3/03/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. USPN 5,761,329 (hereinafter "Chen") in view of Kuhn et al IEEE published *Eigenfaces and eigenvoices: dimensionality reduction for specialized pattern recognition* (as disclosed in the IDS filed 3/03/03 hereinafter "Kuhn").

Claim 14 discloses, "a method of performing person recognition comprising the steps of: processing a video signal of at least one person of a select group of people to obtain data of a first eigenvector; processing an audio signal of the at least one person of the select group of people to obtain data of a second eigenvector; concatenating the data of the first eigenvector with the data of the second eigenvector to obtain a composite eigenvector; and using the composite eigenvector to make a recognition decision about a person."

Chen discloses a method for authenticating an individual that employs both audio and video data (col. 1 lines 9-10). Chen states that authentication procedures based on either still images or voice alone can be circumvented. As seen in figure 1, audio and visual data of an individual speaking a phrase is obtained (col. 1 lines 36-40). Identifying audio features and video features are then extracted from the audio data and the video

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data respectively (col. 1 lines 41-43). A composite feature vector is formed which incorporates both the audio features and video features (col. 1 lines 43-44). The feature vector is compared to a stored feature vector of a validated user and if the match within a threshold the individual is authenticated (col. 1 lines 44-48).

Chen does not explicitly disclose that the data obtained from the video signal and the data obtained from the audio signal are eigenvectors.

Kuhn discloses that there are hidden analogies between two well known research areas of eigenvoices and eigenfaces (first sentence of the abstract). Kuhn further discloses that face recognition researchers have recently adopted representations that make explicit the underlying low dimensionality of the task, greatly improving the performance of their systems while reducing computational costs. Kuhn argues that speech researchers should use similar techniques to represent variations between speakers (second paragraph of the abstract).

Chen and Kuhn are analogous art because they are from the same field of endeavor of user authentication.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Chen and Kuhn to obtain eigenvoice and eigenface vectors and then combine the two vectors to form a composite vector for recognition. Chen teaches that it is well known to combine audio and video signals for recognition purposes, and Kuhn teaches that eigenfaces and eigenvoices are advantageous. The motivation for using eigenvectors is that it would improve the performance and greatly reduce the

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computational costs. Thus it would have been obvious to one of ordinary skill in the art to combine Chen and Kuhn to obtain the invention as specified in claim 14.

Regarding claim 15, as seen in figure 1, step 107 matches the composite feature vector to a database. It would be obvious that if this composite feature vector is made up of video and audio features then the feature vectors in the database must also contain video and audio features, and that the information in the database would be obtained via a similar process that the information to be authenticated was obtained.

Regarding claim 16, as discussed above for claim 14, it would be obvious to use an eigenface vector and a eigenvoice vector to obtain the composite feature vector.

Claim 1 has similar limitations to claim 14, however claim 1 is broader since it does not specify that the eigenvectors are obtained from video and audio signals. Thus the same arguments used for the rejection of claim 14 apply equally to claim 1.

Regarding claims 2-3, Kuhn discloses that with eigenfaces PCA is used to derive a low-dimensional coordinate set from a collection of high-dimensional data points (second paragraph of EIGENFACES FOR FACE RECOGNITION section).

Furthermore, Kuhn recites that PCA is widely used in speech recognition (first paragraph of EIGENVOICES FOR SPEAKER ADAPTATION).

The limitations of claims 4-9 regarding eigenvoices and eigenfaces have already been presented with the rejection of claim 14.

Regarding claim 10, Chen discloses a database of users 132 thus the composite eigenvector would be compared against different users each have a different eigenvector.

The limitations of claims 11-13 have been already been presented with the rejection of claims 14-15.

Claim 17 has similar limitations to claim 1 except claim 17 is an apparatus claim, thus the same arguments used for claim 1 (or claim 14) apply equally to the rejection of claim 17.

Claim 18 has limitations that have already been presented with the rejection of claim 14.

Claim 19 recites similar limitations to those presented for the rejection of claim 14, with the further limitation of storage means for storing the composite eigenvector. As seen in figure 4, Chen discloses a memory which is attached to a microprocessor to store the composite vector.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 5,412,738 discloses a recognition system that has improved reliability using both audio and video signals.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B Strege whose telephone number is (703) 305-8679. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS



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